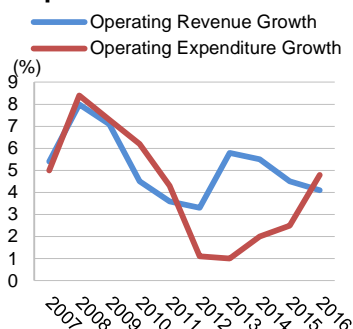


2016 Water and Sewer Medians

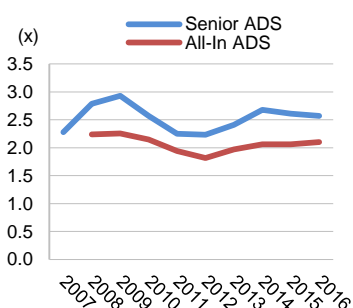
Special Report

Revenue and Expenditure Medians



Source: Fitch.

Debt Service Coverage Medians



Source: Fitch.

Related Research

2016 Outlook: Water and Sewer Sector (December 2015)

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Sector Strength Continues

The 2016 medians continue Fitch Ratings' effort to provide transparency to market participants by giving a clear understanding of certain statistical ratios used in its review of sector revenue bond credits and quantitative results, particularly as they pertain to retail systems. The medians continue to point to ongoing capital and debt pressures but also spotlight the sector's overall financial strength even as incremental borrowings were absorbed into utilities' balance sheets.

Key Findings

National Medians

Lower Revenue Performance: Revenue growth was adequate for the year at just over 4% but has trended downward over the past four years on flat water sales and wastewater flows, meaning revenue gains came almost exclusively from rate adjustments.

Rising Expenses: Annual operating expenses, which have been on an upward trajectory the past several years, grew at a faster pace (almost 5%) than operating revenues for the first time in five years. In addition, the growth rate was nearly double that from the prior medians. Somewhat positively, debt carrying costs were down 1%, helping to limit the overall growth in expenses.

Flat Coverage: Debt service coverage (DSC) remained strong on both a senior lien and all-in basis (2.6x and 2.1x, respectively), remaining unchanged from the prior year as rising operating expenses essentially offset revenue gains.

Net Cash Flows Dip: Despite the favorable DSC, overall sector performance slipped for the year as surplus cash flows fell short of covering annual depreciation expense (that is, renewal and replacement), falling to just 91% from the 2015 medians' 102%. The declining margins point to an ongoing concern of utilities' capacity to maintain depreciating assets on a pay-as-you-go basis (that is, a steady state) without having to borrow for rehabilitation efforts.

Liquidity Jumps Significantly: While cash flows were somewhat anemic, key liquidity levels rose nearly 20%, driven predominantly by a pullback in capital spending.

Capital Spending Remains Depressed: Actual capital spending dropped to the lowest level Fitch has observed since publishing its medians (just 113% of annual depreciation). The lack of spending contributed to an inability to improve the age of facilities, which, at 14 years, is the same as the 2015 median and ties the oldest of any median result. Moderate increases in planned capital spending are expected for the 2017 medians and beyond, but planned outlays remain below those during and immediately before the recession, adding concern to the ongoing age of utility infrastructure over the coming years.

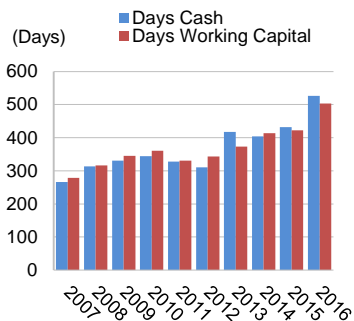
Manageable Debt Profile: Key debt ratios were up a moderate 2%–6% for the year. Over the next five years, additional debt is expected to comprise a manageable 38% of capital spending sources, which will limit the growth in system debt levels to 0%–2% annually.

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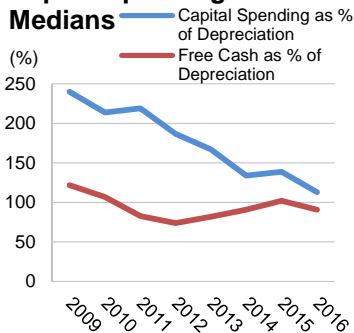
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Liquidity Medians



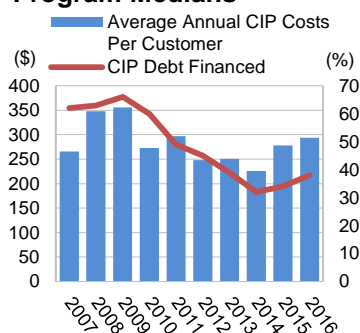
Source: Fitch.

Cost Recovery and Capital Spending Medians



Source: Fitch.

Capital Improvement Program Medians



Source: Fitch.

Related Criteria

Revenue-Supported Rating Criteria (June 2014)
U.S. Water and Sewer Revenue Bond Rating Criteria (September 2015)

Regional Medians

Far West: The Far West's financial performance continued to be among the strongest of all the regions, posting DSC, liquidity and cash flows that were in excess of national levels. The regional debt burden, both current and projected, was above the national medians, which is similar to historical results.

Midwest: DSC improved slightly in the Midwest, but financial results overall were largely negative as expenses grew faster than revenue gains, pushing surplus cash flows lower from the prior year, and cash balances were reduced. Debt levels improved over the prior medians, although capital spending was minimal despite the oldest facilities of all the regions.

Northeast: Financial results in the Northeast were also down somewhat from the 2015 medians. Debt levels, which are the highest among the regions, also increased from the prior year and should escalate further in the coming years as nearly 90% of capital sources are expected to be debt financed.

Southeast: Southeast financial results were among the highest of the regions, consistent with prior results. In addition, debt levels in the Southeast remained favorable relative to the other systems nationwide. Also similar to prior medians, the only significant negative for the region relates to cost of service, which is among the highest of all the regions and near Fitch's affordability benchmark. However, there do not appear to be any significant concerns relating to costs given modest future planned rate hikes, manageable capital spending and relatively robust cash flows compared with nationwide statistics, providing sufficient operating flexibility.

Southwest: Financial results for the region were good for the year but lower than those of prior years on slowing revenue growth, which was undoubtedly associated with ongoing drought conditions in much of the region and related calls for conservation. Unlike all other regions, debt levels in the Southwest actually declined slightly from last year, but this was more a function of the rapid principal amortization rate in the region, which still posts by far the quickest pace of debt repayment nationally, with nearly 60% of principal repaid within 10 years.

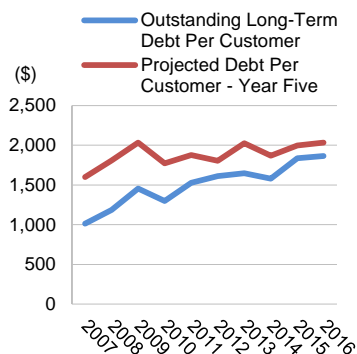
Medians Relative to System Size

Large Systems: Large systems (defined as utilities serving 500,000 or more persons) in general continued to have the greatest amount of debt and produce the lowest financial margins. Facilities remain among the oldest in the nation, but significant spending to date has improved asset life. Planned capital continues to climb, but expected debt financing is down from last year, which should keep debt escalation over the intermediate term relatively modest.

Midsized Systems: Midsized systems (defined as utilities serving between 100,000 and 499,999 persons) continued to generate stronger financial performance on balance than other utilities, while having the lowest debt burdens and some of the lowest rates. Like large and small systems, midsized utilities saw surplus cash flows erode for the year from last year's results. However, unlike the other two types of utilities, midsized system surplus cash flows still exceeded annual depreciation expense for the year.

Small Systems: Small systems (defined as utilities serving fewer than 100,000 persons) continued to produce financial and debt metrics in the midrange relative to other utilities. Financial results could come under pressure in future years based on a rise in planned capital spending amid a lack of borrowing plans (just 13% of capital is expected to be debt financed) and only modest planned rate hikes. Consequently, reserve levels, which are currently robust, might come down a bit in future years.

Debt Medians



Source: Fitch.

Limitations of Medians Analysis in the Rating Process

While the medians serve as a useful tool for market participants by allowing for broad assessments and comparisons of credit quality, Fitch maintains that the data complement the rating process rather than act as a substitute. Thus, when evaluating the medians in relation to the rating process, certain distinctions between them should be noted, as follows:

Point in Time: Medians largely provide a point-in-time snapshot of the rating category, region, class size or sector as a whole, whereas the rating process focuses more on trends at the issuer and specific rating level.

Exclusion of Rating Factors: Only a portion of the factors covered in Fitch's rating process is reflected in the medians — in particular, qualitative aspects such as management, policies and legal provisions are excluded, although other quantitative ratios are also omitted.

Individual Credit Characteristics Excluded: The medians present a composite of the range of credits and do not delineate offsetting strengths or weaknesses at the individual credit level that may affect a rating.

Methodology and Data

Fitch first published its water and sewer medians in 2004 to provide issuers, consultants, analysts, investors and others with a quantitative framework of ratios used in Fitch's water and sewer rating process. To this end, Fitch historically has grouped the medians according to their respective area within the criteria review process, and the 2016 medians continue this practice.

This report also continues Fitch's presentation of key ratios used in the rating process to give the market a better understanding of the priority in weighting certain ratios. To allow a comparison with prior statistics, Fitch also has included historical information from the 2007–2015 medians (see *Appendix D, page 9*); the 2004 medians were excluded, given that the methodology for the selection of credits was revised following their release. Fitch expects to add subsequent information annually to Appendix D as ensuing medians are published, to allow readers to follow long-term trends.

As with Fitch's prior medians, those for 2016 cover only wholly or predominantly retail systems for which Fitch has taken rating actions on senior lien debt or debt that effectively acts as senior lien obligations. The data include water and sewer revenue bond credits rated between September 2014 and August 2015. Certain credits have been excluded for various reasons, as outlined below. In cases where the same issuer was rated multiple times over the median selection period, only data from the most recent rating were incorporated into the medians.

In the 2016 medians, combined water and sewer utilities accounted for 69 credits (58% of the total), individual water systems numbered 31 (26%) and individual sewer systems were 19 (16%). Certain credits with ratings of 'BBB+' or below were excluded for median-reporting purposes from the 2016 data set because Fitch traditionally has viewed these issuers as outliers with extenuating circumstances. Also excluded were issuers for which the majority of system revenues were derived from other utility (such as electric power) revenues. In both cases, the data have a tendency to skew median results.

Appendix A: Water and Sewer Median Definitions

Median	Definition	Significance
Population	Estimated population of the service area.	Provides an overview of the scope of operations in the service area.
MHI (\$)	Median household income for the primary municipal entity served by the utility based on the most recent year as reported by the U.S. Census Bureau.	Indicates the overall wealth of average residential customers and their ability to pay for services.
Total Water Customers	Most recent water customer accounts total, if applicable.	Provides an overview of the scope of operations in the service area.
Water Customer Annual Growth (%)	Percentage of historical average annual customer accounts growth rates over the prior five-year period.	Indicates the pressures a utility may be facing to meet customer demands.
Total Sewer Customers	Most recent sewer customer accounts total, if applicable.	Provides an overview of the scope of operations in the service area.
Sewer Customer Annual Growth (%)	Percentage of historical average annual customer accounts growth rates over the prior five-year period.	Indicates the pressures a utility may be facing to meet customer demands.
Top 10 Customers as % of Revenues	Total annual receipts from the 10 largest customers divided by total operating system revenues for the year.	Indicates revenue concentration levels.
Age of Plant (Years)	Total accumulated depreciation divided by annual depreciation.	Indicates age of facilities and potential deferred plant maintenance
Water Treatment Capacity Remaining (%)	Percentage of average permitted treatment capacity remaining above most recent production level.	Indicates the pressures a utility may be facing to meet customer demands.
Sewer Treatment Capacity Remaining (%)	Percentage of average permitted treatment capacity remaining above most recent production level.	Indicates the pressures a utility may be facing to meet customer demands.
Average Annual CIP Costs per Customer (\$)	Total projected capital needs in the CIP divided by the number of years of the CIP, divided by total number of customers (for a combined utility, the aggregate number of water and sewer accounts is used).	Indicates effect of the CIP on ratepayers (principal only).
CIP Debt Financed (%)	Percentage of issuer's total CIP expected to be debt financed.	Indicates future debt leverage of capital assets.
Total Outstanding Debt to Net Plant Assets (%)	Total amount of utility long-term debt divided by the net asset value of the plant.	Indicates existing debt leverage of capital assets.
Debt to FADS (x)	Total amount of utility long-term debt divided by the total funds available for debt service.	Indicates existing debt leverage relative to existing funds available for debt service.
Debt to Equity (x)	Total amount of utility long-term debt divided by unrestricted net assets.	Indicates existing debt leverage relative to system equity.
Total Outstanding Long-Term Debt Per Customer (\$) ^a	Total amount of utility long-term debt divided by the total number of utility customers (for a combined utility, the aggregate number of water and sewer accounts are used).	Indicates the existing debt burden attributable to ratepayers (principal only).
Total Outstanding Long-Term Debt Per Capita (\$) ^a	Total amount of utility long-term debt divided by total population served by the utility.	Indicates the existing debt burden of a utility attributable to each person served by the utility (principal only).
Ten-Year Principal Payout (%)	Percentage of principal amortizing within 10 years.	Indicates longevity of system debt.
Twenty-Year Principal Payout (%)	Percentage of principal amortizing within 20 years.	Indicates longevity of system debt.
Projected Debt Per Customer – Year Five (\$) ^a	Total projected outstanding system debt (existing debt less scheduled amortization plus planned issuances) divided by total outstanding projected customers five years from the date of the rating (for a combined utility, the aggregate number of water and sewer accounts is used and is inflated by anticipated growth).	Indicates the total debt burden to ratepayers five years from the date of the rating (principal only).
Projected Debt Per Capita – Year Five (\$) ^a	Total projected outstanding system debt (existing debt less scheduled amortization plus planned issuances) divided by total projected population served by the utility (population is inflated based on anticipated growth).	Indicates the total debt burden of a utility to each person served by the utility five years from the date of the rating (principal only).
Individual Water/Sewer Utility Average Monthly Residential Bill (\$)	Average monthly residential bill for individual utilities; when billing was not calculated on a monthly basis, it was converted to a monthly amount for standardization.	Indicates the monthly cost of service to residential customers.
Individual Water/Sewer Utility Average Annual Bill as % of MHI	Average monthly residential bill for individual utilities times 12, divided by the most recent yearly MHI as reported by the U.S. Census Bureau.	Indicates the annual burden for cost of service to ratepayers.
Combined Water/Sewer Utility Average Monthly Residential Bill (\$)	Average monthly residential bill for combined utilities; when billing was not calculated on a monthly basis, it was converted to a monthly amount for standardization.	Indicates the monthly cost of service to residential customers.
Combined Water/Sewer Utility Average Annual Bill as % of MHI	Average monthly residential bill for combined utilities times 12, divided by the most recent yearly MHI as reported by the U.S. Census Bureau.	Indicates the annual burden for cost of service to ratepayers.

^aIndicates key ratio. MHI – Median household income. CIP – Capital improvement program. FADS – Funds available for debt service.

Appendix A: Water and Sewer Median Definitions (continued)

Median	Definition	Significance
Average Annual Projected Water Rate Increases (%)	Sum of planned annual rate increases divided by the number of years over which increases are forecast.	Indicates the future expected burden for cost of service to ratepayers.
Average Annual Projected Sewer Rate Increases (%)	Sum of planned annual rate increases divided by the number of years over which increases are forecast.	Indicates the future expected burden for cost of service to ratepayers.
Three-Year Historical Average Senior Lien ADS Coverage (x) ^a	Most recent three-year historical average of annual revenues available for debt service divided by respective senior lien debt service for the year.	Indicates the historical trend in senior lien ADS coverage.
Senior Lien ADS Coverage (x) ^a	Current-year revenues available for debt service divided by current-year senior lien debt service.	Indicates the financial margin to meet current senior lien ADS with current revenues available for debt service.
Senior Lien ADS Coverage Excluding Connection Fees (x)	Current-year revenues available for debt service, excluding one-time revenues such as connection fees, divided by current-year senior lien debt service.	Indicates the financial margin to meet current senior lien ADS with current revenues available for debt service, excluding one-time revenues such as connection fees.
Senior Lien ADS Coverage Net of Transfers Out (x)	Current-year revenues available for debt service, excluding operating transfers out, divided by current-year senior lien debt service.	Indicates the financial margin to meet current senior lien ADS with current revenues available for debt service, excluding transfers out.
Minimum Projected Senior Lien ADS Coverage (x) ^a	Minimum debt service coverage projected typically over the ensuing five-year period, based on revenues available for debt service in any given fiscal year, divided by the respective senior lien debt service amount for that fiscal year.	Indicates the financial margin during the year in which future senior lien ADS coverage is projected to be the lowest.
Senior Lien MADS Coverage (x)	Current-year revenues available for debt service divided by projected senior lien MADS.	Indicates the financial margin to meet projected senior lien MADS with current revenues available for debt service.
Senior Lien Debt Service as % of Gross Revenues	Current-year senior lien debt service divided by current-year gross revenues.	Indicates the level of annual senior lien debt service burden on system operations.
Three-Year Historical Average All-In ADS Coverage (x) ^a	Most recent three-year historical average of annual revenues available for debt service divided by respective total debt service for the year.	Indicates the historical trend in total ADS coverage.
All-In ADS Coverage (x) ^a	Current-year revenues available for debt service divided by current-year total debt service.	Indicates the financial margin to meet current total ADS with current revenues available for debt service.
All-In ADS Coverage Excluding Connection Fees (x)	Current-year revenues available for debt service, excluding one-time revenues such as connection fees, divided by current-year total debt service.	Indicates the financial margin to meet current total ADS with current revenues available for debt service, excluding one-time revenues such as connection fees.
All-In ADS Coverage Net of Transfers Out (x)	Current-year revenues available for debt service, excluding operating transfers out, divided by current-year total debt service.	Indicates the financial margin to meet current total ADS with current revenues available for debt service, excluding transfers out.
Minimum Projected All-In ADS Coverage (x) ^a	Minimum debt service coverage projected typically over the ensuing five-year period, based on revenues available for debt service in any given fiscal year, divided by the respective total debt service amount for that fiscal year.	Indicates the financial margin during the year in which future total ADS coverage is projected to be the lowest.
All-In MADS Coverage (x)	Current-year revenues available for debt service divided by projected total MADS.	Indicates the financial margin to meet projected total MADS with current revenues available for debt service.
All-In Debt Service as % of Gross Revenues	Current-year total debt service divided by current-year gross revenues.	Indicates the level of annual total debt service burden on system operations.
Operating Margin (%)	Operating revenues minus operating expenditures plus depreciation, divided by operating revenues.	Indicates financial margin to pay operating expenses.
Operating Cash Flow Ratio (x)	Cash flows from current operations divided by current liabilities.	Indicates the strength of existing cash flows to meet near-term obligations.
Operating Revenue Growth – Current Year (%)	Most recent audited operating revenues divided by the immediately prior year operating revenues minus one.	Indicates revenue gains.
Operating Revenue Growth – Three-Year Average (%)	Average of operating revenues divided by the immediately prior year operating revenues minus one for the three most recent audited fiscal years.	Indicates revenue gains.
Operating Expenditure Growth – Current Year (%)	Most recent audited operating expenses divided by the immediately prior year operating expenses minus one.	Indicates expenditure pressures.

^aIndicates key ratio. ADS – Annual debt service. MADS – Maximum annual debt service.

Appendix A: Water and Sewer Median Definitions (continued)

Median	Definition	Significance
Operating Expenditure Growth – Three-Year Average (%)	Average of operating expenses divided by the immediately prior year operating expenses minus one for the three most recent audited fiscal years.	Indicates expenditure pressures.
Days of Operating Revenues in Accounts Receivable	Current unrestricted accounts receivable divided by operating revenues, divided by 365.	Indicates rate at which customer revenues are received.
Days Cash on Hand ^a	Current unrestricted cash and investments plus any restricted cash and investments (if available for general system purposes), divided by operating expenditures minus depreciation, divided by 365.	Indicates financial flexibility to pay near-term obligations.
Days of Working Capital ^a	Current unrestricted assets plus any restricted cash and investments (if available for general system purposes), minus current liabilities payable from unrestricted assets, divided by operating expenditures minus depreciation, divided by 365.	Indicates financial flexibility to pay near-term obligations.
Quick Ratio	Current cash plus current receivables divided by current liabilities.	Indicates financial flexibility to pay near-term obligations.
Current Ratio	Current assets divided by current liabilities.	Indicates financial flexibility to pay near-term obligations.
Free Cash as % of Depreciation ^a	Current surplus revenues after payment of operating expenses, debt service and operating transfers out divided by current-year depreciation.	Indicates annual financial capacity to maintain facilities at current level of service from existing cash flows.
Capital Spending as % of Depreciation	Current-year additions to property, plant and equipment divided by current-year depreciation.	Indicates annual improvements made to system facilities relative to level of annual depreciation to effectively determine if facilities are being maintained.

^aIndicates key ratio.

Appendix B: 2016 Regional Medians

	Far West	Midwest	Northeast	Southeast	Southwest	All Credits
Community Characteristics/Customer Growth and Concentration						
Population	132,574	524,771	2,200,000	177,131	137,147	161,967
MHI (\$)	57,826	47,004	53,136	47,876	47,989	51,683
Total Water Customers	24,201	18,897	126,900	56,522	64,154	47,643
Annual Growth (%)	0.5	1.4	0.1	1.0	0.7	0.7
Total Sewer Customers	57,650	59,336	736,970	51,987	42,616	53,657
Annual Growth (%)	0.2	0.5	0.7	1.3	1.4	0.9
Top 10 Customers as % of Revenues	9	3	9	10	6	8
Capacity						
Age of Plant (Years)	14	20	16	14	13	14
Water Treatment Capacity Remaining (%)	56	56	56	56	63	58
Sewer Treatment Capacity Remaining (%)	40	54	45	42	44	42
Capital Demands and Debt Policies						
Average Annual CIP Costs Per Customer (\$)	333	154	347	265	267	294
CIP Debt Financed (%)	24	40	87	35	55	38
Total Outstanding Debt to Net Plant Assets (%)	40	57	93	47	46	46
Debt to FADS (x)	5.3	3.0	11.8	5.4	6.4	5.9
Debt to Equity (x)	2.1	1.1	13.4	2.9	6.6	3.1
Total Outstanding Long-Term Debt Per Customer (\$) ^a	2,038	1,642	2,802	1,642	1,280	1,865
Total Outstanding Long-Term Debt Per Capita (\$) ^a	660	760	538	396	415	521
Ten-Year Principal Payout (%)	38	67	20	40	61	42
Twenty-Year Principal Payout (%)	81	82	50	83	99	86
Projected Debt Per Customer – Year Five (\$) ^a	2,203	1,851	3,921	1,981	1,820	2,035
Projected Debt Per Capita – Year Five (\$) ^a	610	885	709	484	468	526
Charges and Rate Affordability						
Individual Water/Sewer Utility Average Monthly Residential Bill (\$)	43	37	34	42	37	43
Individual Water/Sewer Utility Average Annual Bill as % of MHI	0.8	1.0	0.4	0.9	0.8	0.8
Combined Water/Sewer Utility Average Monthly Residential Bill (\$)	65	98	74	72	54	67
Combined Water/Sewer Utility Average Annual Bill as % of MHI	1.4	1.5	1.7	1.8	1.3	1.7
Average Annual Projected Water Rate Increases (%)	2.6	3.2	5.9	2.6	3.6	3.0
Average Annual Projected Sewer Rate Increases (%)	4.2	8.0	5.2	2.8	3.8	3.5
Coverage and Financial Performance/Cash and Balance Sheet Considerations						
Three-Year Historical Average Senior Lien ADS Coverage (x) ^a	2.7	4.7	1.7	2.5	2.4	2.5
Senior Lien ADS Coverage (x) ^a	3.0	3.6	1.6	2.6	2.2	2.6
Senior Lien ADS Coverage Excluding Connection Fees (x)	2.6	3.4	1.6	2.3	2.1	2.4
Senior Lien ADS Coverage Net of Transfers Out (x)	2.8	2.2	1.6	2.5	2.0	2.4
Minimum Projected Senior Lien ADS Coverage (x) ^a	2.1	3.8	1.5	2.1	2.0	2.1
Senior Lien MADS Coverage (x)	2.1	2.4	N.A.	2.5	2.0	2.0
Senior Lien Debt Service as % of Gross Revenues	15	14	11	18	21	17
Three-Year Historical Average All-In ADS Coverage (x) ^a	2.4	1.9	1.5	2.2	2.0	2.1
All-In ADS Coverage (x) ^a	2.3	1.8	1.6	2.3	1.8	2.1
All-In ADS Coverage Excluding Connection Fees (x)	2.1	1.7	1.6	2.0	1.7	2.0
All-In ADS Coverage Net of Transfers Out (x)	2.1	1.7	1.4	2.1	1.6	1.9
Minimum Projected All-In ADS Coverage (x) ^a	1.9	1.9	1.4	1.7	1.6	1.7
All-In MADS Coverage (x)	2.3	2.4	1.3	3.2	1.7	1.8
All-In Debt Service as % of Gross Revenues	19	27	25	21	25	21
Operating Margin (%)	37	38	44	41	40	40
Operating Cash Flow Ratio (x)	1.5	0.5	1.0	1.7	1.2	1.5
Operating Revenue Growth – Current Year (%)	5.6	3.8	4.7	4.2	1.4	4.1
Operating Revenue Growth – Three-Year Average (%)	6.8	8.7	4.7	3.7	2.2	4.3
Operating Expenditure Growth – Current Year (%)	5.2	8.8	4.8	3.7	4.9	4.8
Operating Expenditure Growth – Three-Year Average (%)	4.8	27.6	2.6	2.4	2.9	3.5
Days of Operating Revenues in Accounts Receivable	49	52	56	43	48	48
Days Cash on Hand ^a	606	126	277	565	372	526
Days of Working Capital ^a	619	150	142	593	365	503
Quick Ratio	4.7	1.0	2.0	5.3	3.2	4.2
Current Ratio	5.4	1.7	2.1	5.4	4.1	5.0
Free Cash as % of Depreciation ^a	104	76	91	102	64	91
Capital Spending as % of Depreciation	108	54	372	109	113	113

^aIndicates key ratio. ADS – Annual debt service. CIP – Capital improvement program. FADS – Funds available for debt service. MADS – Maximum annual debt service. MHI – Median household income. N.A. – Not available.

Appendix C: 2016 Medians Relative to System Size

	System Size Classification			All Credits
	Large	Medium	Small	
Community Characteristics/Customer Growth and Concentration				
Population	956,719	170,668	53,025	161,967
MHI (\$)	52,317	49,535	53,607	51,683
Total Water Customers	216,897	56,141	18,241	47,643
Annual Growth (%)	0.6	1.0	0.6	0.7
Total Sewer Customers	212,431	54,678	19,344	53,657
Annual Growth (%)	0.8	0.9	1.0	0.9
Top 10 Customers as % of Revenues	8	8	12	8
Capacity				
Age of Plant (Years)	14	14	11	14
Water Treatment Capacity Remaining (%)	56	58	61	58
Sewer Treatment Capacity Remaining (%)	38	42	48	42
Capital Demands and Debt Policies				
Average Annual CIP Costs Per Customer (\$)	333	268	275	294
CIP Debt Financed (%)	49	38	13	38
Total Outstanding Debt to Net Plant Assets (%)	54	38	47	46
Debt to FADS (x)	7.9	4.7	5.1	5.9
Debt to Equity (x)	6.2	2.1	3.0	3.1
Total Outstanding Long-Term Debt Per Customer (\$) ^a	2,528	1,345	1,642	1,865
Total Outstanding Long-Term Debt Per Capita (\$) ^a	518	396	711	521
Ten-Year Principal Payout (%)	38	42	46	42
Twenty-Year Principal Payout (%)	81	88	93	86
Projected Debt Per Customer Capita – Year Five (\$) ^a	2,545	1,898	2,014	2,035
Projected Debt Per Capita – Year Five (\$) ^a	538	500	551	526
Charges and Rate Affordability				
Individual Water/Sewer Utility Average Monthly Residential Bill (\$)	48	34	48	43
Individual Water/Sewer Utility Average Annual Bill as % of MHI	0.9	0.7	0.8	0.8
Combined Water/Sewer Utility Average Monthly Residential Bill (\$)	74	67	65	67
Combined Water/Sewer Utility Average Annual Bill as % of MHI	1.5	1.7	1.8	1.7
Average Annual Projected Water Rate Increases (%)	3.8	3.6	1.8	3.0
Average Annual Projected Sewer Rate Increases (%)	4.3	3.8	2.4	3.5
Coverage and Financial Performance/Cash and Balance Sheet Considerations				
Three-Year Historical Average Senior Lien ADS Coverage (x) ^a	2.1	2.8	2.5	2.5
Senior Lien ADS Coverage (x) ^a	2.2	2.8	2.7	2.6
Senior Lien ADS Coverage Excluding Connection Fees (x)	2.0	2.5	2.4	2.4
Senior Lien ADS Coverage Net of Transfers Out (x)	2.1	2.6	2.4	2.4
Minimum Projected Senior Lien ADS Coverage (x) ^a	2.0	2.2	2.1	2.1
Senior Lien MADS Coverage (x)	1.9	2.0	2.3	2.0
Senior Lien Debt Service as % of Gross Revenues	22	15	17	17
Three-Year Historical Average All-In ADS Coverage (x) ^a	1.7	2.4	2.3	2.1
All-In ADS Coverage (x) ^a	1.7	2.4	2.3	2.1
All-In ADS Coverage Excluding Connection Fees (x)	1.7	2.1	2.2	2.0
All-In ADS Coverage Net of Transfers Out (x)	1.7	2.2	2.1	1.9
Minimum Projected All-In ADS Coverage (x) ^a	1.6	1.8	1.8	1.7
All-In MADS Coverage (x)	1.5	1.9	2.1	1.8
All-In Debt Service as % of Gross Revenues	27	20	18	21
Operating Margin (%)	45	40	37	40
Operating Cash Flow Ratio (x)	1.3	1.5	1.5	1.5
Operating Revenue Growth – Current Year (%)	4.8	3.3	3.9	4.1
Operating Revenue Growth – Three-Year Average (%)	4.7	3.9	5.1	4.3
Operating Expenditure Growth – Current Year (%)	4.0	5.1	5.0	4.8
Operating Expenditure Growth –Three-Year Average (%)	2.6	4.0	3.9	3.5
Days of Operating Revenues in Accounts Receivable	46	47	49	48
Days Cash on Hand ^a	334	571	522	526
Days of Working Capital ^a	385	580	566	503
Quick Ratio	2.9	5.4	4.2	4.2
Current Ratio	3.4	6.1	4.5	5.0
Free Cash as % of Depreciation ^a	80	102	91	91
Capital Spending as % of Depreciation	146	117	91	113

^aIndicates key ratio. ADS – Annual debt service. CIP – Capital improvement program. FADS – Funds available for debt service. MADS – Maximum annual debt service. MHI – Median household income.

Appendix D: Year-Over-Year Sectorwide Medians Comparison

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Community Characteristics/Customer Growth and Concentration										
Population	119,037	234,103	162,338	144,162	150,142	153,272	172,778	149,025	190,713	161,967
MHI (\$)	40,656	45,733	45,820	47,179	50,146	50,294	51,518	49,655	50,610	51,683
Total Water Customers	37,299	61,076	50,410	37,264	40,755	39,441	48,169	40,431	47,982	47,643
Annual Growth (%)	2.5	2.4	1.6	1.7	1.4	0.5	0.4	0.6	0.6	0.7
Total Sewer Customers	32,903	64,039	48,000	40,306	48,949	34,984	50,296	35,210	52,802	53,657
Annual Growth (%)	2.8	2.5	1.9	1.5	1.7	0.6	0.8	0.6	0.6	0.9
Top 10 Customers as % of Revenues	9	8	8	7	7	8	8	8	7	8
Capacity										
Age of Plant (Years)	13	13	12	13	12	13	13	13	14	14
Water Treatment Capacity Remaining (%)	53	50	50	54	53	58	58	58	58	58
Sewer Treatment Capacity Remaining (%)	32	35	35	38	42	41	47	47	42	42
Capital Demands and Debt Policies										
Average Annual CIP Costs Per Customer (\$)	266	348	356	273	297	248	251	226	278	294
CIP Debt Financed (%)	62	63	66	60	49	45	39	32	34	38
Total Outstanding Debt to Net Plant Assets (%)	40	39	39	43	44	45	47	43	48	46
Debt to FADS (x)	—	—	4.9	5.5	6.4	6.7	6.8	6.1	6.2	5.9
Debt to Equity (x)	—	—	—	—	3.2	3.5	3.8	3.3	3.4	3.1
Total Outstanding Long-Term Debt Per Customer (\$) ^a	1,012	1,185	1,454	1,297	1,527	1,611	1,650	1,581	1,836	1,865
Total Outstanding Long-Term Debt Per Capita (\$) ^a	—	—	379	375	425	458	460	459	491	521
Ten-Year Principal Payout (%)	40	30	40	39	38	39	38	39	40	42
Twenty-Year Principal Payout (%)	87	70	82	80	79	80	78	80	82	86
Projected Debt Per Customer – Year Five (\$) ^a	1,599	1,808	2,036	1,774	1,877	1,803	2,024	1,868	1,997	2,035
Projected Debt Per Capita – Year Five (\$) ^a	—	—	607	446	531	532	566	519	522	526
Charges and Rate Affordability										
Individual Water/Sewer Utility Average Monthly Residential Bill (\$)	23	29	28	28	35	33	37	36	39	43
Individual Water/Sewer Utility Average Annual Bill as % of MHI	0.6	0.7	0.8	0.7	0.8	0.7	0.8	0.9	0.8	0.8
Combined Water/Sewer Utility Average Monthly Residential Bill (\$)	47	56	56	59	61	61	65	68	69	67
Combined Water/Sewer Utility Average Annual Bill as % of MHI	1.4	1.4	1.3	1.5	1.4	1.5	1.5	1.6	1.6	1.7
Average Annual Projected Water Rate Increases (%)	4.1	4.4	4.9	5.3	5.0	4.8	4.4	4.0	3.8	3.0
Average Annual Projected Sewer Rate Increases (%)	5.0	5.1	5.9	5.9	5.8	5.1	5.0	3.7	4.7	3.5
Coverage and Financial Performance/Cash and Balance Sheet Considerations										
Three-Year Historical Average Senior Lien ADS Coverage (x) ^a	—	2.7	3.0	2.9	2.7	2.5	2.4	2.5	2.6	2.5
Senior Lien ADS Coverage (x) ^a	2.3	2.8	2.9	2.6	2.3	2.2	2.4	2.7	2.6	2.6
Senior Lien ADS Coverage Excluding Connection Fees (x)	2.0	2.3	2.3	2.4	2.1	2.1	2.3	2.5	2.4	2.4
Senior Lien ADS Coverage Net of Transfers Out (x)	—	—	—	—	2.1	2.1	2.3	2.4	2.4	2.4
Minimum Projected Senior Lien ADS Coverage (x) ^a	1.8	1.9	1.9	1.9	1.8	1.9	1.8	2.1	2.0	2.1
Senior Lien MADS Coverage (x)	1.9	2.0	2.1	2.4	1.9	2.1	2.0	2.1	2.0	2.0
Senior Lien Debt Service as % of Gross Revenues	18	16	15	16	17	17	17	16	16	17
Three-Year Historical Average All-In ADS Coverage (x) ^a	—	—	2.1	2.4	2.3	2.1	2.0	2.0	2.1	2.1
All-In ADS Coverage (x) ^a	—	2.2	2.3	2.2	1.9	1.8	2.0	2.1	2.1	2.1
All-In ADS Coverage Excluding Connection Fees (x)	—	—	1.8	1.9	1.7	1.7	1.8	1.9	1.9	2.0
All-In ADS Coverage Net of Transfers Out (x)	—	—	—	—	1.8	1.7	1.8	1.9	2.0	1.9
Minimum Projected All-In ADS Coverage (x) ^a	—	—	1.7	1.6	1.5	1.6	1.5	1.7	1.6	1.7
All-In MADS Coverage (x)	—	—	1.8	2.0	1.7	1.6	1.6	1.7	1.8	1.8
All-In Debt Service as % of Gross Revenues	—	20	21	18	20	22	21	21	22	21
Operating Margin (%)	34	36	33	32	33	36	39	39	41	40
Operating Cash Flow Ratio (x)	—	—	1.1	1.0	1.0	1.1	1.3	1.3	1.4	1.5
Operating Revenue Growth – Current Year (%)	5.4	8.0	7.1	4.5	3.6	3.3	5.8	5.5	4.5	4.1
Operating Revenue Growth – Three-Year Average (%)	—	—	6.5	6.0	5.3	4.3	4.7	5.5	5.7	4.3
Operating Expenditure Growth – Current Year (%)	5.0	8.4	7.3	6.2	4.3	1.1	1.0	2.0	2.5	4.8
Operating Expenditure Growth – Three-Year Average (%)	—	—	7.5	7.7	8.1	4.1	2.7	1.9	2.8	3.5
Days of Operating Revenues in Accounts Receivable	45	45	47	48	46	47	46	46	45	48
Days Cash on Hand ^a	266	313	331	344	328	310	417	404	432	526
Days of Working Capital ^a	279	316	345	361	331	343	373	414	422	503
Quick Ratio	—	—	2.9	3.3	2.9	2.9	3.1	3.4	3.2	4.2
Current Ratio	—	—	3.3	3.8	3.3	3.9	3.8	4.1	3.7	5.0
Free Cash as % of Depreciation ^a	—	—	122	107	83	74	82	91	102	91
Capital Spending as % of Depreciation	223	264	240	214	219	187	167	134	139	113

^aIndicates key ratio. ADS – Annual debt service. CIP – Capital improvement program. FADS – Funds available for debt service. MADS – Maximum annual debt service. MHI – Median household income.

Appendix E: 2016 Medians Relative to Rating Category

	Rating Category			All Credits
	AAA	AA	A	
Community Characteristics/Customer Growth and Concentration				
Population	330,000	148,502	114,555	161,967
MHI (\$)	59,165	51,283	46,177	51,683
Total Water Customers	95,854	43,704	32,400	47,643
Annual Growth (%)	1.1	0.6	1.2	0.7
Total Sewer Customers	88,122	42,979	45,984	53,657
Annual Growth (%)	1.1	0.9	0.8	0.9
Top 10 Customers as % of Revenues	6	9	10	8
Capacity				
Age of Plant (Years)	14	14	13	14
Water Treatment Capacity Remaining (%)	61	56	56	58
Sewer Treatment Capacity Remaining (%)	44	41	56	42
Capital Demands and Debt Policies				
Average Annual CIP Costs Per Customer (\$)	239	325	198	294
CIP Debt Financed (%)	28	44	24	38
Total Outstanding Debt to Net Plant Assets (%)	27	47	67	46
Debt to FADS (x)	4.0	6.2	7.4	5.9
Debt to Equity (x)	1.4	3.4	4.5	3.1
Total Outstanding Long-Term Debt Per Customer (\$) ^a	1,093	2,050	2,351	1,865
Total Outstanding Long-Term Debt Per Capita (\$) ^a	297	577	675	521
Ten-Year Principal Payout (%)	50	40	44	42
Twenty-Year Principal Payout (%)	93	84	87	86
Projected Debt Per Customer Year Five (\$) ^a	933	2,308	2,008	2,035
Projected Debt Per Capita Year Five (\$) ^a	246	593	595	526
Charges and Rate Affordability				
Individual Water/Sewer Utility Average Monthly Residential Bill (\$)	26	45	50	43
Individual Water/Sewer Utility Average Annual Bill as % MHI	0.5	0.9	0.9	0.8
Combined Water/Sewer Utility Average Monthly Residential Bill (\$)	62	72	67	67
Combined Water/Sewer Utility Average Annual Bill as % of MHI	1.3	1.7	2.0	1.7
Average Annual Projected Water Rate Increases (%)	3.0	3.2	2.5	3.0
Average Annual Projected Sewer Rate Increases (%)	3.3	3.8	2.8	3.5
Coverage and Financial Performance/Cash and Balance Sheet Considerations				
Three-Year Historical Average Senior Lien ADS Coverage (x) ^a	2.8	2.5	2.1	2.5
Senior Lien ADS Coverage (x) ^a	3.2	2.6	2.0	2.6
Senior Lien ADS Coverage Excluding Connection Fees (x)	2.7	2.3	2.0	2.4
Senior Lien ADS Coverage Net of Transfers Out (x)	2.8	2.4	2.0	2.4
Minimum Projected Senior Lien ADS Coverage (x) ^a	2.9	2.1	1.7	2.1
Senior Lien MADS Coverage (x)	2.4	2.2	2.0	2.0
Senior Lien Debt Service as % of Gross Revenues	12	17	24	17
Three-Year Historical Average All-In ADS Coverage (x) ^a	2.5	2.0	1.7	2.1
All-In ADS Coverage (x) ^a	2.6	2.0	1.7	2.1
All-In ADS Coverage Excluding Connection Fees (x)	2.4	1.8	1.6	2.0
All-In ADS Coverage Net of Transfers Out (x)	2.5	1.8	1.7	1.9
Minimum Projected All-In ADS Coverage (x) ^a	2.1	1.7	1.4	1.7
All-In MADS Coverage (x)	2.2	1.7	1.8	1.8
All-In Debt Service as % of Gross Revenues	18	20	25	21
Operating Margin (%)	40	40	40	40
Operating Cash Flow Ratio (x)	1.5	1.5	1.3	1.5
Operating Revenue Growth Current Year (%)	4.8	4.1	2.9	4.1
Operating Revenue Growth Three-Year Average (%)	4.7	4.4	3.9	4.3
Operating Expenditure Growth Current Year (%)	4.5	4.7	6.1	4.8
Operating Expenditure Growth Three-Year Average (%)	3.0	3.5	4.5	3.5
Days of Operating Revenues in Accounts Receivable	40	47	51	48
Days Cash on Hand ^a	764	485	221	526
Days of Working Capital ^a	733	502	242	503
Quick Ratio	5.6	4.2	2.5	4.2
Current Ratio	5.9	5.0	3.4	5.0
Free Cash as % of Depreciation ^a	114	91	83	91
Capital Spending as % of Depreciation	115	111	111	113

^aIndicates key ratio. ADS – Annual debt service. CIP – Capital improvement program. FADS – Funds available for debt service. MADS – Maximum annual debt service. MHI – Median household income.

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